

Rings Node Report

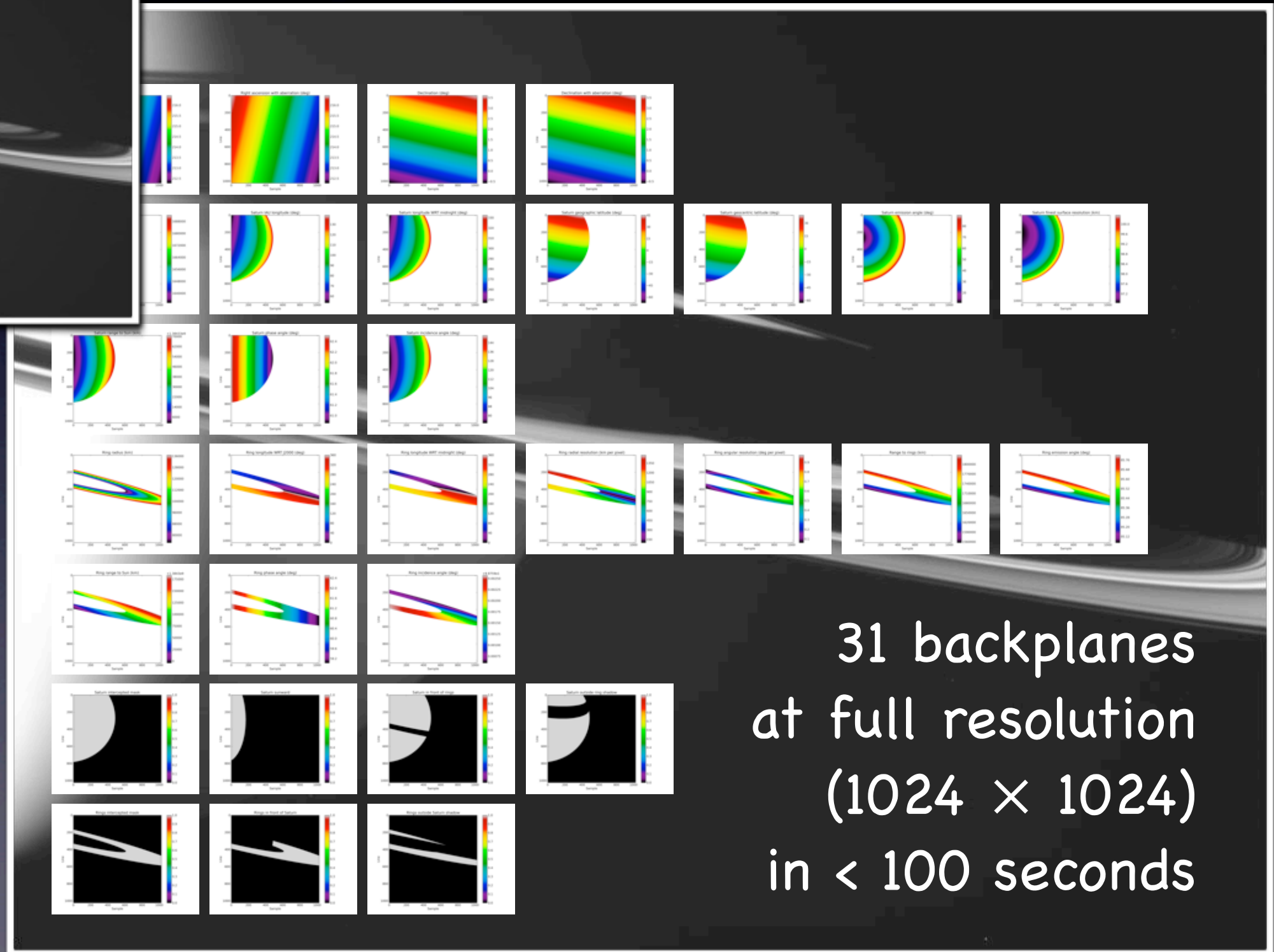
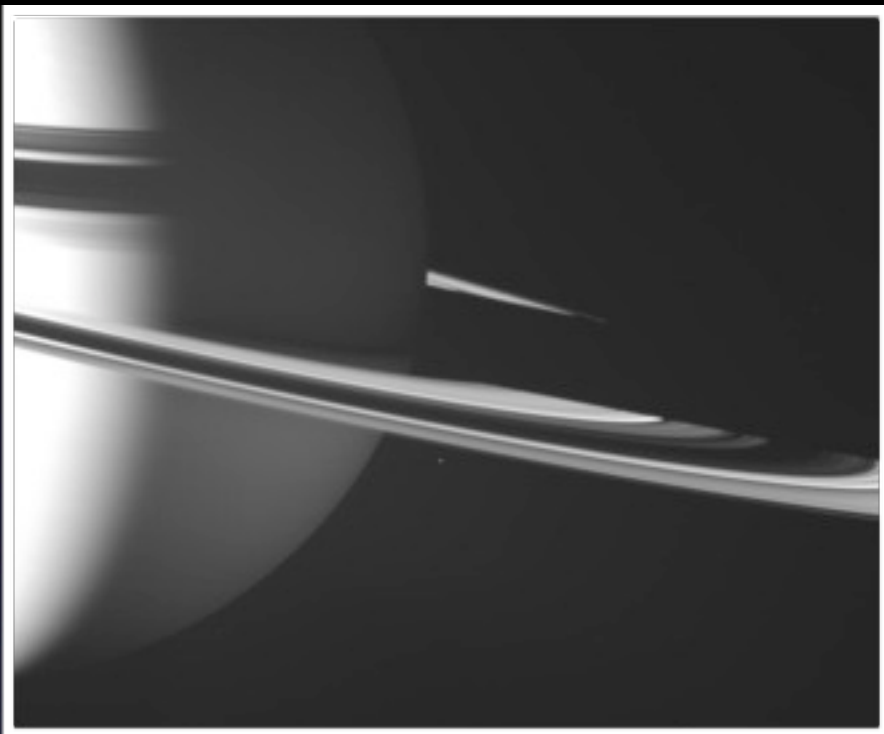
Mark & Mitch
PDPMC, Columbia, Maryland
August 28–29, 2012

Cassini Metadata & Opus Search*

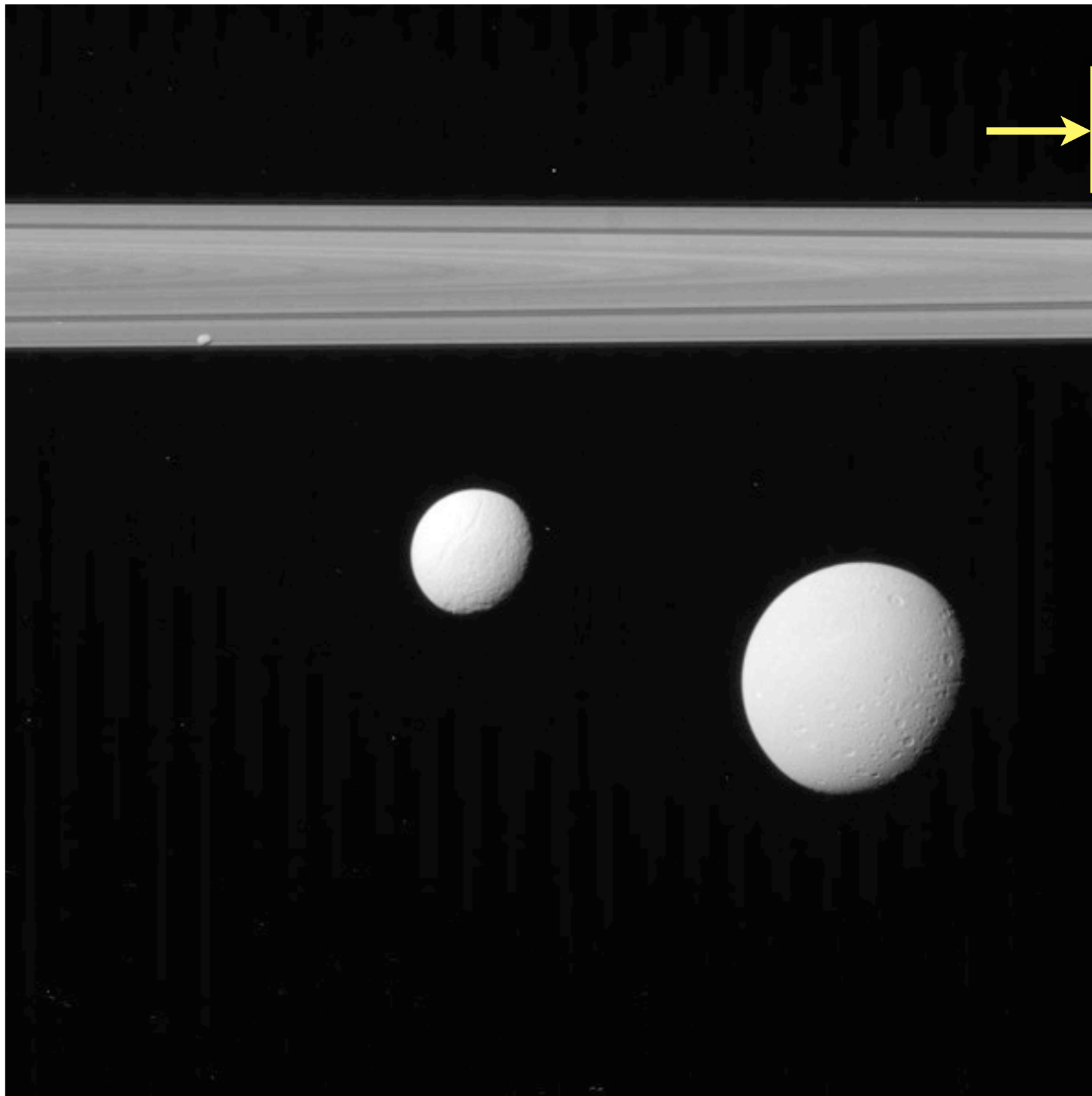
- Goal: Enable detailed geometric searches across all four Cassini ORS data sets.
- Generate target lists for all ORS products.
- Generate geometric metadata for all planetary surfaces and rings using a thorough sampling of the field of view.
- Incorporate these new search capabilities into OPUS.

*Partially funded by the Cassini Project/JPL.

From the March PDSMC...



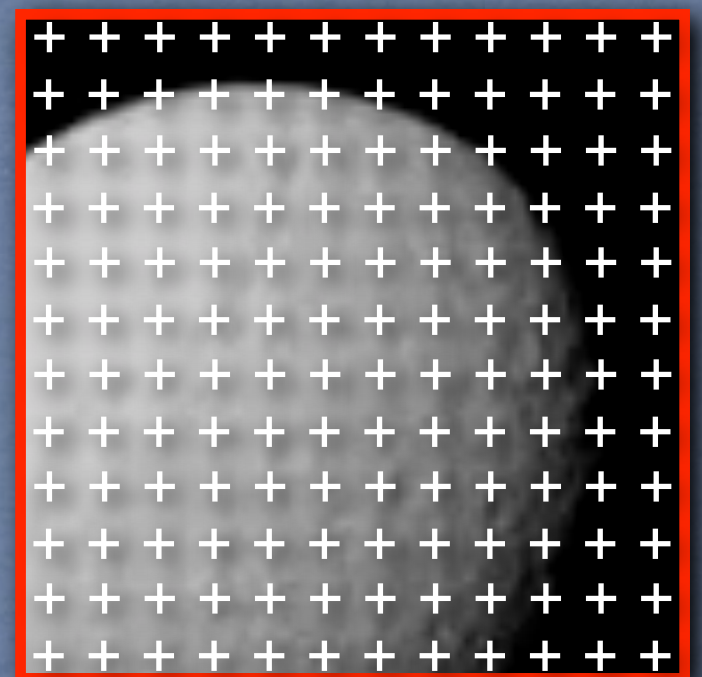
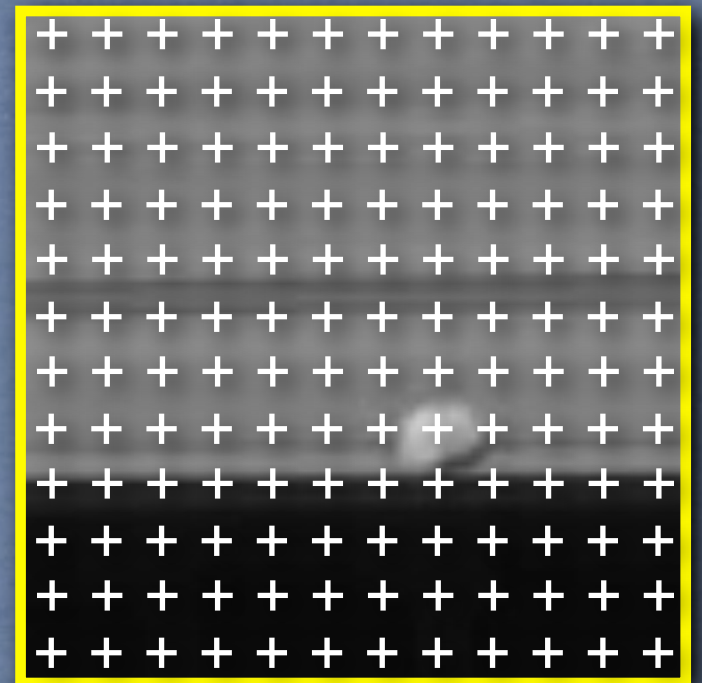
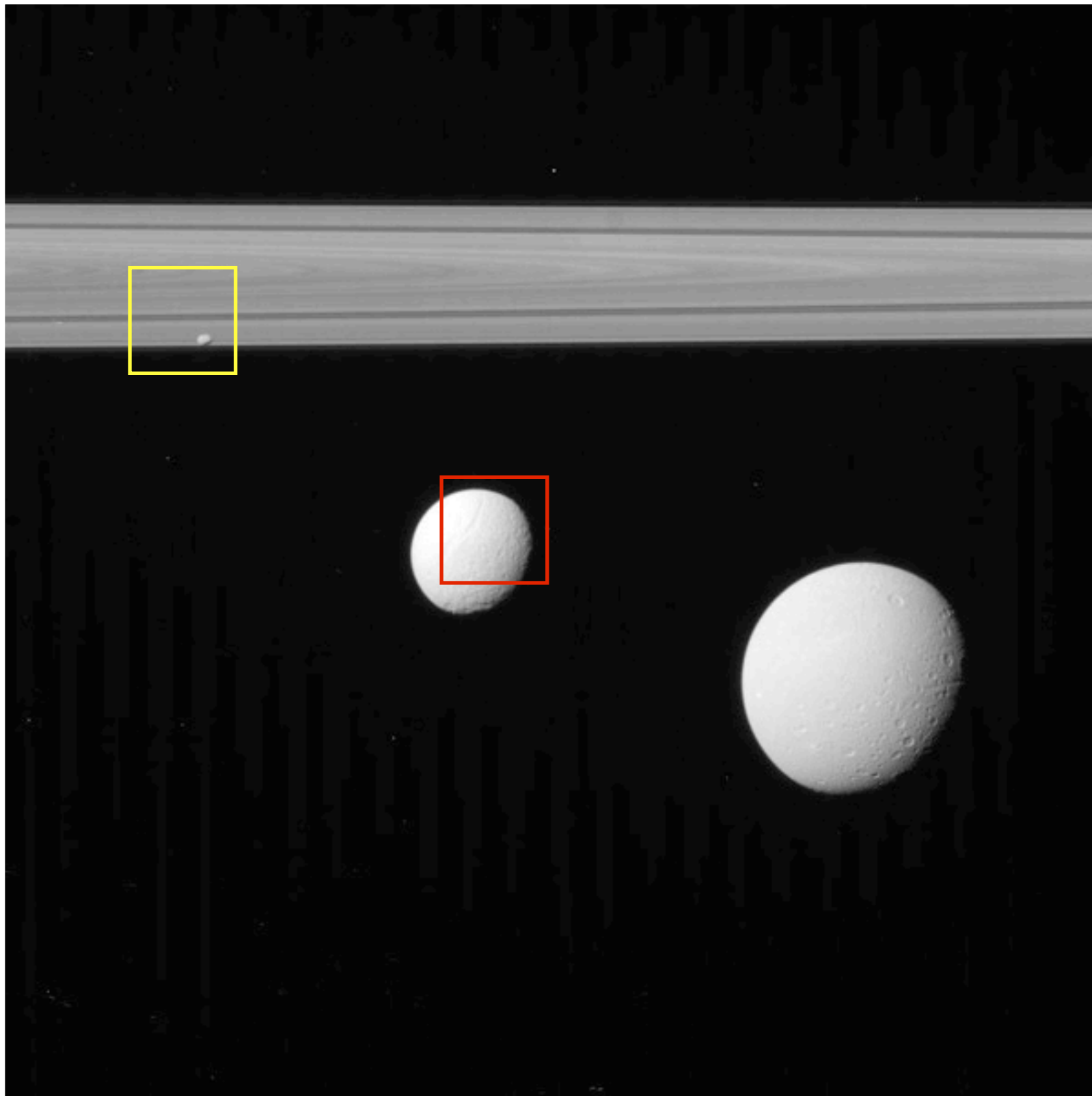
Cassini ISS Metadata Production



25 NAC
pixels for
pointing
uncertainty

Cassini ISS Metadata Production

8×8 sampling
density



“Target List” Test Case

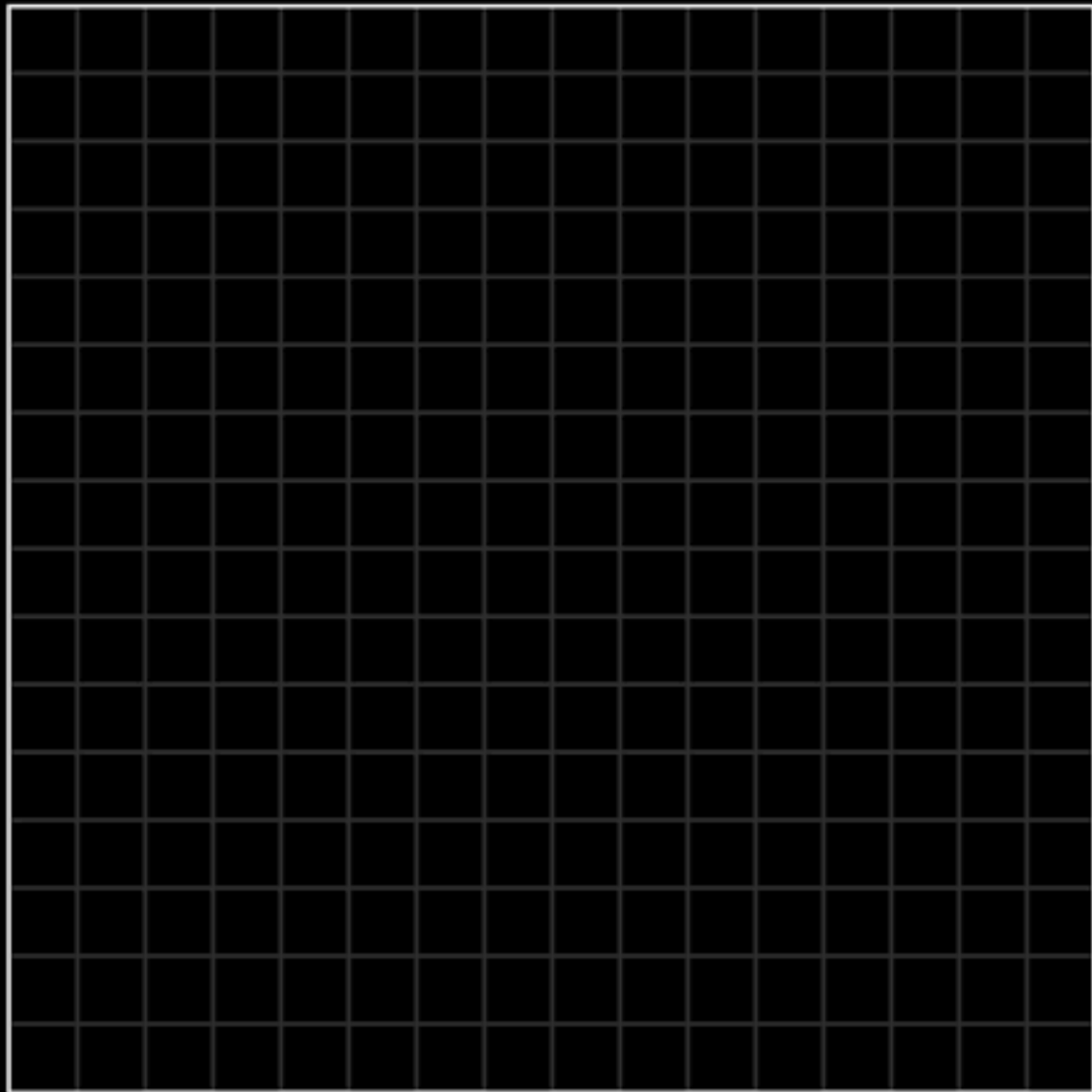


"S/IMG/CO/ISS/1638397472/N", "ENCELADUS", "RHEA"
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"S/IMG/CO/ISS/1638397598/N", "ENCELADUS", "RHEA"
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"S/IMG/CO/ISS/1638398228/N", "ENCELADUS", "RHEA"

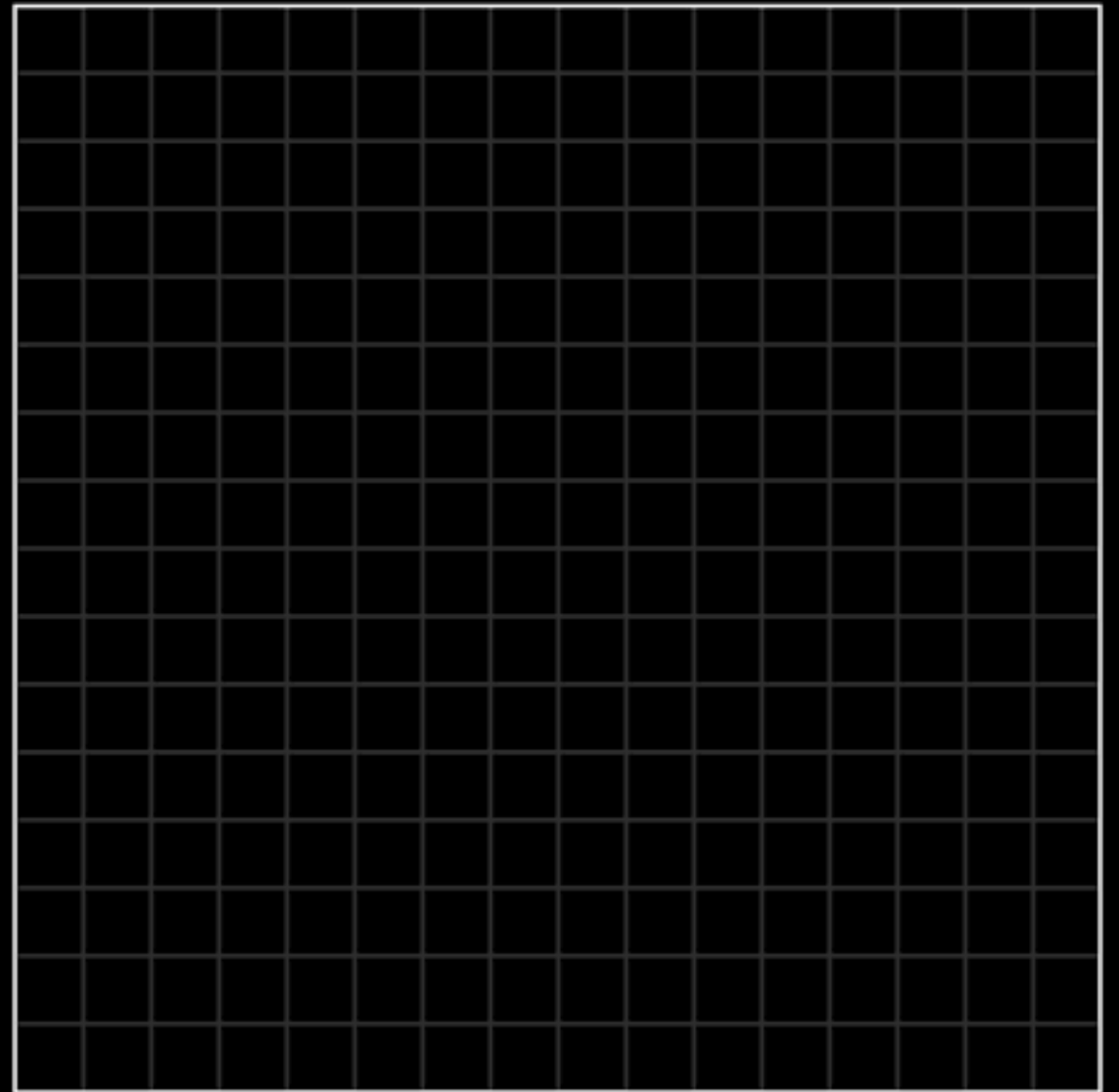


VIMS Full Frame

Visual

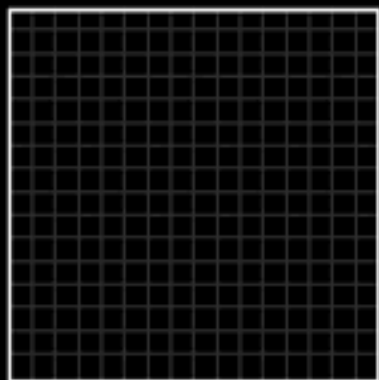


Infrared



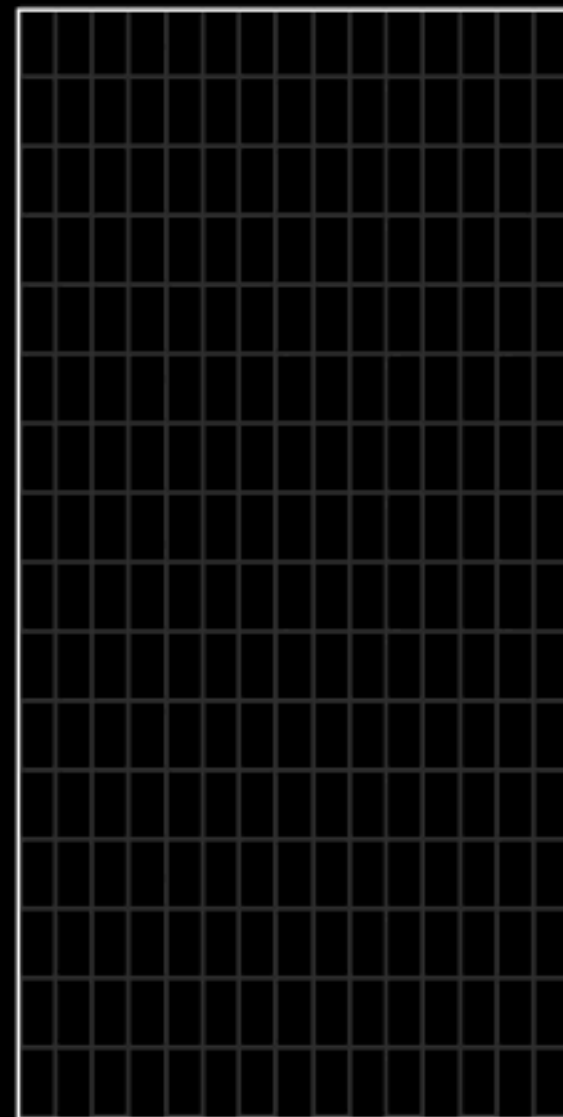
VIMS Hi-Res Mode

Visual



$(1/3 \times 1/3)$

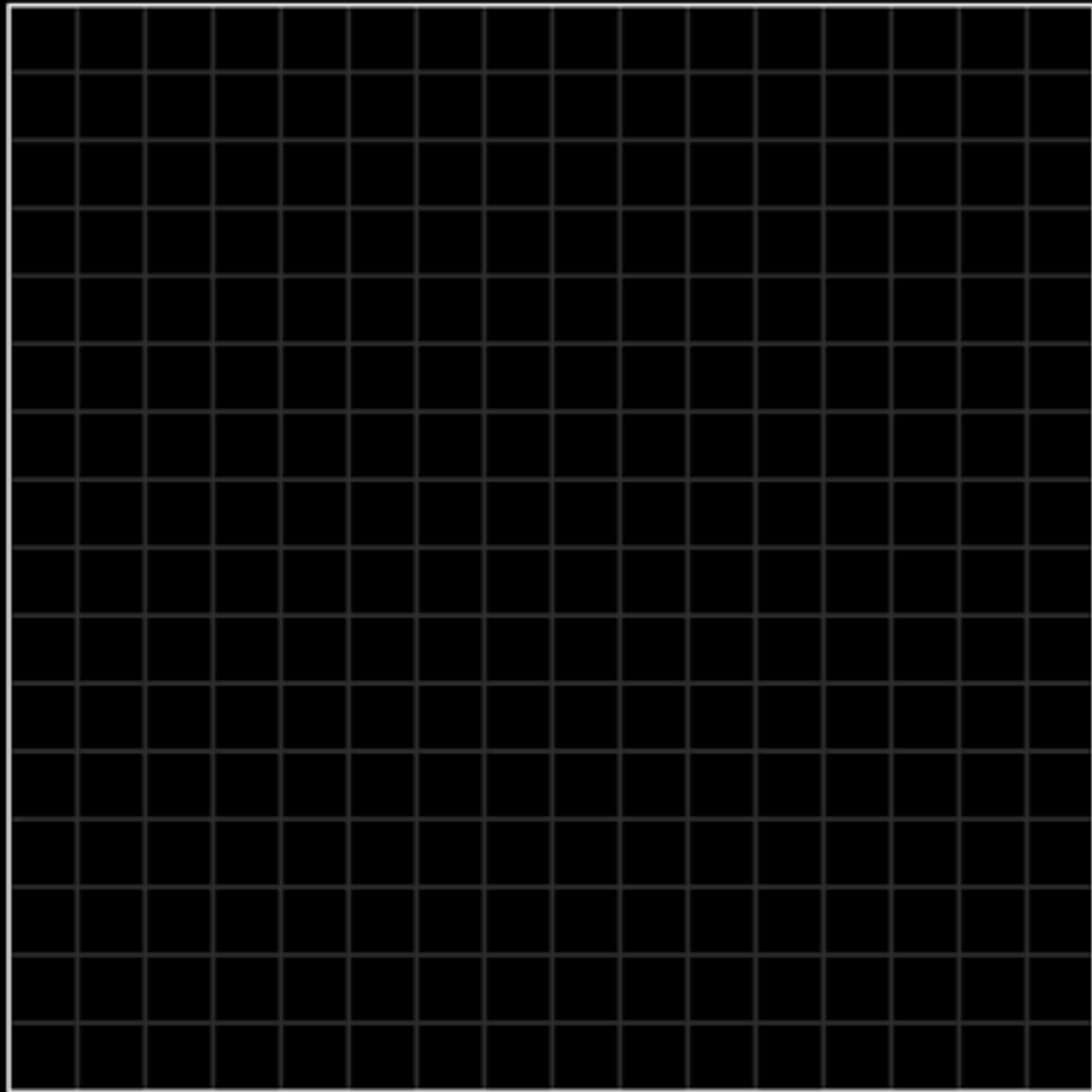
Infrared



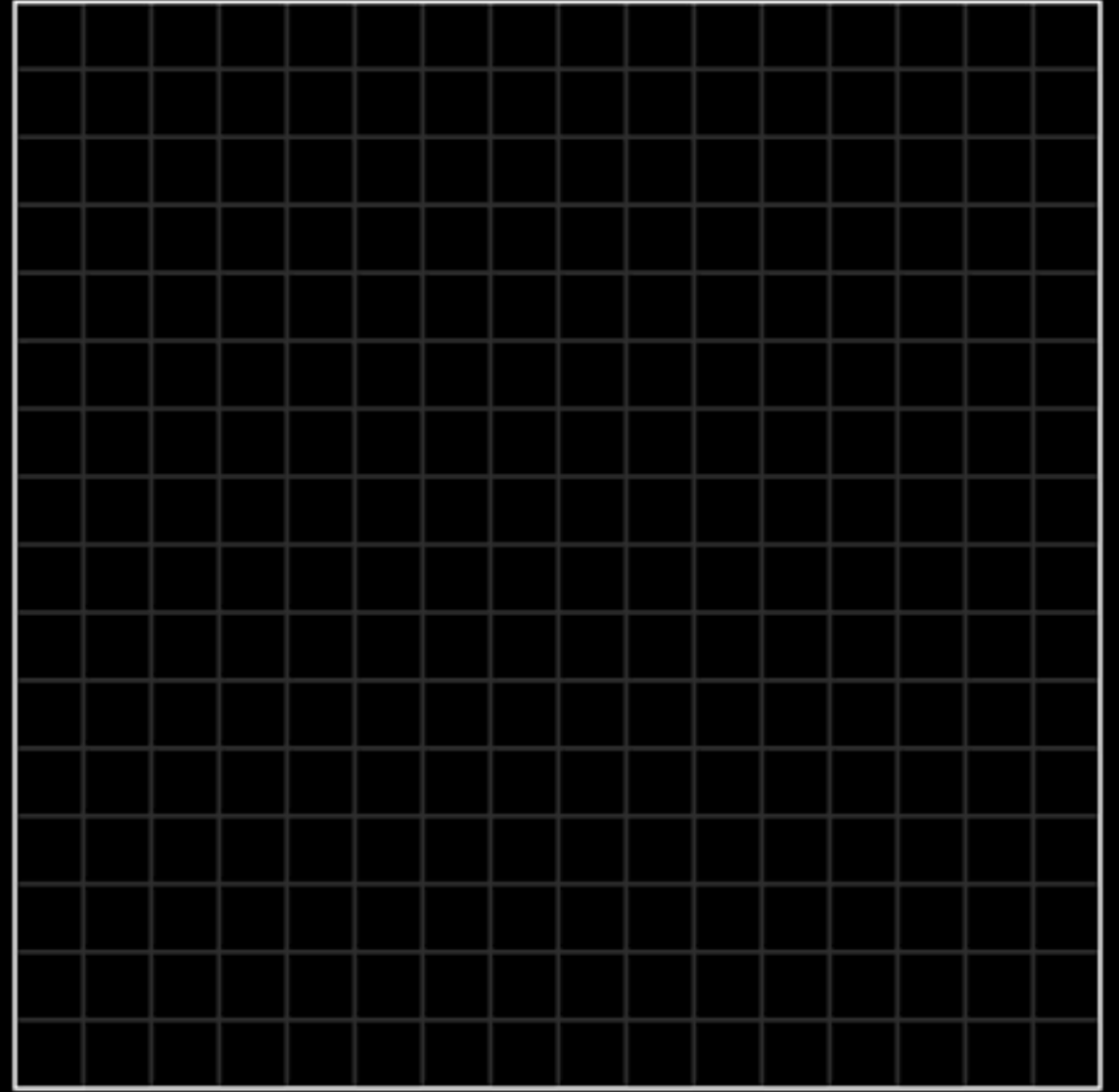
$(1/2 \times 1)$

VIMS Arbitrary Subarray

Visual

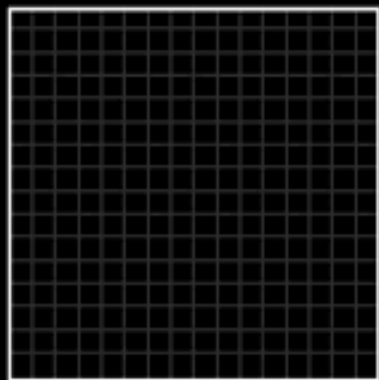


Infrared



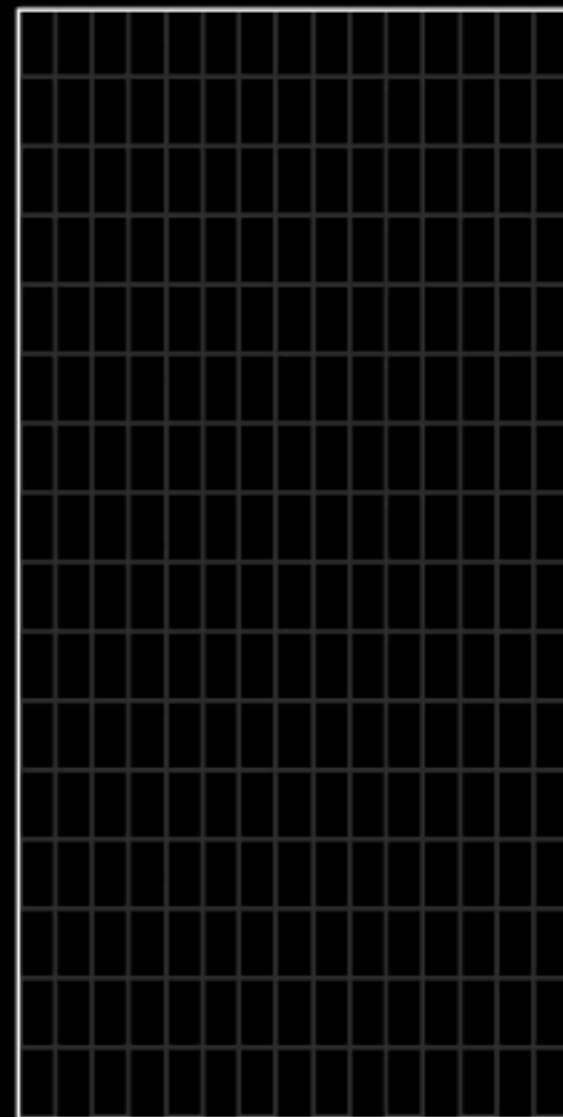
VIMS Hi-Res Subarray

Visual



$(1/3 \times 1/3)$

Infrared



$(1/2 \times 1)$

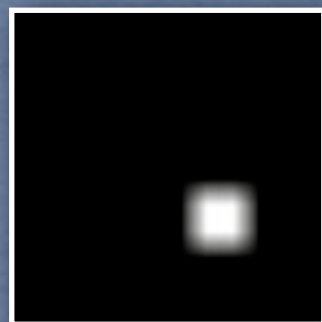
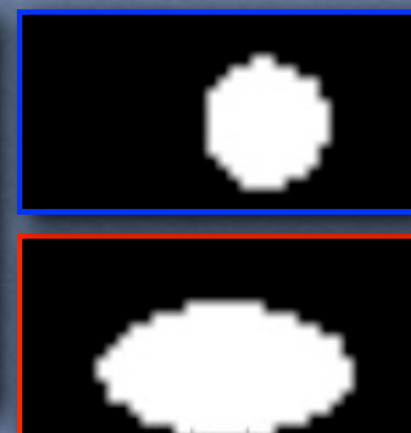
Cassini VIMS Backplanes



Approach phase
Saturn disk and main rings



Mimas in VIS normal
and IR hi-res mode



Solar port

OPUS Entry Page with new “Target Body” selector

OPUS

recent changes

contact us

start over

Result Count: 10

View Results

☒ General Constraints

Ring Geometry Constraints

Wavelength Constraints

Cassini Mission Constraints

Enceladus Surface Geometry

General Constraints

show alert

▼ Planet ⓘ

☐ Jupiter ☐ Saturn 10 ☐ Uranus ☐ Neptune ☐ Venus ☐ Earth

▼ Nominal Target Name ⓘ

▶ Saturn Targets

▶ Jupiter Targets

▶ Neptune Targets

▶ Uranus Targets

▶ Other Targets

☒ ▼ Target Body

☐ DAPHNIS 6 ☐ MIMAS 56 ☐ SATURN 3852 ☐ ANTHE 6 ☐ ATLAS 8 ☐ EPIMETHEUS 8 ☐ PROMETHEUS 13

☐ DIONE 60 ☒ ENCELADUS 10 ☐ HELENE 1 ☐ HYPERION 3 ☐ METHONE 6 ☐ PALLENE 5 ☐ PAN 15 ☐ PANDORA 4

☐ RHEA 110 ☐ TETHYS 71 ☐ TITAN 800

▶ Mission ⓘ

▶ Instrument Host Name ⓘ

▶ Instrument Name ⓘ

▶ Observation Time ⓘ

▶ Target Intercept Time

▶ Nominal Target Class ⓘ

▶ Measurement Quantity ⓘ

▶ Data Type ⓘ

▶ Note ⓘ

▶ Observation Class ⓘ

▶ Right Ascension ⓘ

▶ Declination ⓘ

▶ Observation Duration

New OPUS query tab for Enceladus geometry

OPUS

recent changes

contact us

start over

Result Count: 10

View Results

☒ General Constraints

Ring Geometry Constraints

Wavelength Constraints

Cassini Mission Constraints

Enceladus Surface Geometry

▶ Sub Solar Planetocentric Latitude

▶ Sub Solar Planetographic Latitude

▶ Sub Solar IAU Longitude

▶ Sub Observer IAU Longitude

▶ Sub Observer Planetocentric Latitude

▶ Sub Observer Planetographic Latitude

▶ Planetocentric Latitude

▶ Planetographic Latitude

▶ IAU West Longitude

▶ Solar Hour Angle

▶ Longitude WRT Observer

▶ Finest Resolution

▶ Coarsest Resolution

▶ Phase

▶ Incidence

▶ Emission

▶ Range Observer to Surface

▶ Center Resolution

▶ Center Distance

▶ Center Phase Angle

[Rings Node Home](#)

[Browse Volumes Directly](#)

PDS

Atmospheres

Geosciences


Imaging

NAIF

PPI

Rings

Small Bodies



SETI Institute

+ Carl Sagan Center

Curator: Mark Showalter

Webmaster: Neil Heather

Current Status

- ISS & VIMS
 - Geometric metadata indices completed.
 - OPUS integration going smoothly.
- UVIS
 - Tools nearly completed.
- CIRS
 - All development tabled pending delivery of version 3.
- Everything except CIRS is on track for an on-time delivery by September 30.

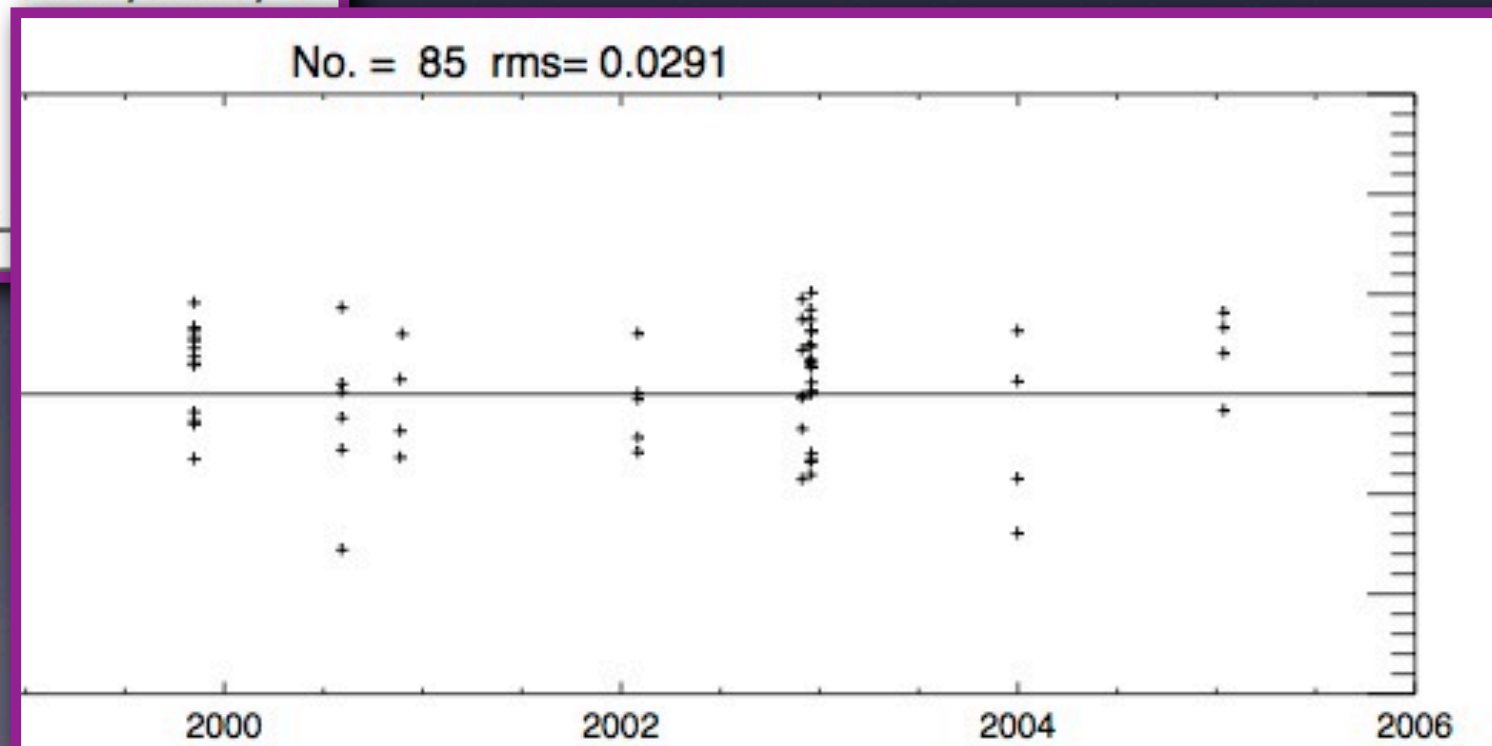
Lessons Learned

- Syntax errors in PDS labels and ASCII indices are pervasive.
- Cassini instruments are extremely complex.
- Archived documentation is completely inadequate.
- VIMS timing cannot be reconstructed accurately without access to un-published telemetry.
- Gaps between C kernels are common.
- Re-deliveries of entire data sets place an enormous burden on the PDS.

PDS4 Testing so far...

- ASTROM_0101
 - HST astrometric data.
 - Simple character tables.
 - Some documentation in PDF format.

```
U3IC0401T",3,"1996-09-30T01:58:16.6",-37.299,0.020,6.171,0.020,0.
"U3IC0402T",3,"1996-09-30T01:59:18.4",-37.534,0.020,6.157,0.020,0.
"U3IC0403T",3,"1996-09-30T02:02:16.6",-37.768,0.020,6.167,0.020,0.
"U3IC0404T",3,"1996-09-30T02:05:16.6",-37.996,0.020,6.167,0.020,0.
"U3IC0405T",3,"1996-09-30T02:08:16.6",-38.216,0.020,6.167,0.020,0.
"U3ICA401T",3,"1996-09-30T02:14:18.4",-38.685,0.020,6.127,0.020,0.
"U3ICA402T",3,"1996-09-30T02:17:16.6",-38.913,0.020,
"U3ICA403T",3,"1996-09-30T02:20:16.6",-39.139,0.020,
"U3ICA201T",3,"1996-10-14T06:51:33.9",-57.866,0.020,
"U3ICA202T",3,"1996-10-14T06:54:18.4",-57.806,0.020,
"U3ICA203T",3,"1996-10-14T06:57:16.6",-57.719,0.020,
"U3ICB101P",3,"1997-01-10T02:14:31.9",-36.259,0.020,
"U3ICB102P",3,"1997-01-10T02:17:16.4",-36.101,0.020,
```



PDS4 Testing so far...

- For Build 1:
 - One data product for each build.
- For Build 2a:
 - + one bundle product.
 - + first cut at the Node Dictionary.
- For Build 2b:
 - + revised Node Dictionary

PDS4 Testing so far...

- For Build 2c: An on-line repository with...
 - One delivery package.
 - One complete bundle.
 - Two collections, 14 data products, 14 associated document products.
 - Each document product is XML plus Postscript & PDF (not PDF-A).
 - Revised Dictionary.
- For Build 2c+ (within next 2 weeks):
 - Dictionary update & errors corrected.

Data Migration Plans

(tentative)

- Astrometry
 - ASTROM_0101 c. October 2012.
 - ASTROM_0001 as a new collection in the same bundle.
- Cassini derived ring occultation profiles
 - UVIS,VIMS and RSS teams are generating ring profiles using similar formats.
 - All were designed with PDS4 in mind.
 - Start in FY13, finish in FY14.

Data Migration Plans

- Cassini CLRS re-formatting
 - The team delivers volumes in the “Vanilla” variable-length record format.
 - Detectors, targets, modes are all mixed together.
 - Our pipeline breaks apart data files by detector & observation using fixed-length records.
 - All efforts were tabled last year when the version 2 delivery broke our pipeline.
 - Version 3 will be delivered c. January 2013.
 - FY13 plan is for simultaneous PDS3 production & PDS4 development.

Known Unknowns

- User Tools
 - We need guidance and a timeline.
 - OPUS adaptation might be easy
...because the interface is already RESTful.
- Estimate of Resources?
 - PDS4 has implications for everything we do.

PDS4 Issues and Concerns

- The rearranging bytes in data sets already archived to PDS3 standards is an extremely expensive, time-consuming and dangerous proposition.
- Cf. our experience with Cassini CLRS.
- Flexibility regarding the acceptance of some legacy file formats may be required.
- E.g., image prefix bytes in Cassini ISS and Voyager ISS data.